17-inch MacBook Pro

Technology Overview
April 2006

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Introducing the 17-inch MacBook Pro

Key features

- Intel Core Duo processor
- 667MHz frontside bus
- 667MHz DDR2 main memory
- PCI Express architecture
- Serial ATA hard drive
- ATI Mobility Radeon X1600 graphics processor with 256MB of GDDR3 SDRAM
- Built-in iSight video camera
- Front Row and Apple Remote
- 36 percent brighter display than the 17-inch PowerBook G4 display
- ExpressCard/34 slot
- Three USB ports
- MagSafe Power Adapter

Comparison leaves no room for doubt. The 17-inch MacBook Pro is simply in a class of its own. One look and you'll admire its svelte 1-inch-thin design and big, brighter display. One minute working on its backlit keyboard and you'll applaud the performance of the Intel Core Duo processor and high-bandwidth architecture. With advanced features like FireWire 800 and a fast double-layer-burning SuperDrive, it's the must-have notebook computer for any creative professional—whether you're in business, the arts, science, technology, or education.

Benchmark performance: Up to five times faster than PowerBook G4

	17-inch PowerBook G4 1.67GHz PowerPC G4	**17-inch MacBook Pro** 2.16GHz Intel Core Duo	Δ
SPECint_rate_base2000 Integer calculation (estimate)	6.6	34.5	5.2x
SPECfp_rate_base2000 Floating-point calculation (estimate)	4.9	27.8	5.7x

Testing conducted by Apple in April 2006 using preproduction 17-inch MacBook Pro units; PowerBook systems were shipping units. See www.spec.org for more information. SPEC benchmarks were compiled using the IBM compiler and a beta version of the Intel compiler for Mac OS. MacBook Pro continuously monitors system thermal and power conditions, and may adjust processor speed as needed to maintain optimal system operation.

The 17-inch MacBook Pro is the thinnest and lightest 17-inch Intel Core Duo–based notebook on the market. A joy to handle as well as to use, it lends tremendous power and breakthrough capabilities to your professional work.

- **Intel Core Duo performance.** MacBook Pro systems harness the power of a revolutionary Intel engine. The dual-core chip delivers the horsepower of two processors, enabling the 17-inch MacBook Pro to execute workloads previously seen only on a Power Mac with a dual-core PowerPC G5.
- **Video conferencing to go.** An iSight camera is seamlessly built into the bezel of the 17-inch display. Joining a video conference is as easy as clicking the iChat icon—no camera to attach, no cables to connect.[1]
- **The portable theater.** The 17-inch MacBook Pro comes equipped with Front Row software and the Apple Remote. You can easily summon photos, music, and videos—and control your Keynote presentations—from up close or across the room. A portfolio powerhouse for pros, it's the perfect way to present your work to a group.
- **Brighter ideas.** See your creative work in the best possible light. MacBook Pro has a spacious 17-inch (diagonal) screen that's 36 percent brighter than the 17-inch PowerBook G4 display.

- **World's most advanced operating system.** Beyond the browser, mail, and other programs that any modern operating system should include, Mac OS X Tiger sets the standard for a whole new class of integrated applications. These include convenient widgets with Dashboard, fast systemwide searching with Spotlight, workflow automation with Automator, and built-in RSS feed detection and display with Safari RSS. And because Mac OS X Tiger is UNIX based, you can count on it to be very stable and secure.

  The 17-inch MacBook Pro. In a class of its own.

Product Overview

Intel is the first microprocessor supplier to move into high-volume production using industry-leading 65-nanometer process technology. By partnering with Intel, Apple can continue to design thinner and lighter Mac computers without compromising on performance.

Powered by a 2.16GHz Intel Core Duo processor, the 17-inch MacBook Pro is off to a great start. Performance skyrockets with a 667MHz frontside bus, 667MHz DDR2 memory, and 16-lane PCI Express graphics. But that's only part of the story. With its built-in iSight camera and Front Row media navigation, this versatile notebook makes on-the-go video conferencing easy and doubles as a portable theater for displaying work to clients.[1]

Intel Core Duo Performance

The Intel Core Duo packs two execution cores on a single silicon chip. A feat of advanced fabrication technology, this processor includes a generous 2MB of shared L2 Smart Cache and sophisticated Dynamic Power Coordination technology. Its superefficient design enables awesome performance while consuming very little energy. The upshot? It's possible to fit dual-core horsepower into a svelte 1-inch-thin enclosure.

Next-generation performance
With two processor cores, you'll do more and wait less: Enjoy smooth playback of a 1080p high definition movie; host a four-way iChat video conference; or render complex 3D models up to four times faster than before.[2] You'll also enjoy new levels of performance in tasks such as web browsing, word processing, and running simulations.

Seamless compatibility
The 17-inch MacBook Pro runs your favorite software, such as Microsoft Office and Adobe Photoshop, thanks to built-in Rosetta technology.[3] Rosetta translates most PowerPC-based applications dynamically, so they run on the Intel-based MacBook Pro. Rosetta is completely transparent and requires no configuration.

To enjoy the full punch of the Intel Core Duo, you can use Universal applications—software that runs natively on both Intel-based and PowerPC-based Mac computers. This includes iWork '06, iLife '06, Final Cut Studio 5.1, Logic Pro 7, Aperture 1.1, and other Apple productivity, entertainment, and creative professional applications. Because they're Universal, they take immediate advantage of the two Intel processor cores in MacBook Pro.

Video on the Go

Because an iSight video camera and microphone are integrated into the 17-inch MacBook Pro enclosure, you're set to participate in video conferences right out of the box—with no additional costs and no complicated configuration. Just open iChat AV (included with Mac OS X), click the video icon for a friend or coworker, and start your face-to-face conversation.[1] With dual-core processing power, MacBook Pro supports up to four participants. And with AirPort Extreme wireless technology built in, you can join a video conference from just about anywhere.[4]

The iSight camera and microphone open up new video possibilities as well. Imagine creating your own video podcasts using iMovie HD and publishing them to the Internet with iWeb.[5] Or consider practicing your upcoming presentation in front of the camera using the included Photo Booth software, or recording your ideas using iMovie. Video communications have never been so easy.

Joining a video conference is as easy as clicking the iChat icon—no camera to attach, no cables to connect.

Portable Theater

The 17-inch MacBook Pro comes with Front Row software and the simple-to-use Apple Remote, so you can access and control your digital media from across the room. Ideal for running a slideshow in iPhoto, browsing a DVD, playing a song or narration in iTunes, or showing the latest edit of your iMovie production, the Apple Remote allows you to navigate from up to 30 feet away. A push of the Menu button takes you to Front Row, a full-screen interface that makes it remarkably simple to find the photos, music, or videos you want to play. You can even use the Apple Remote to navigate a Keynote presentation.[6]

Access your photos, music, and videos from up close or across the room. It's the perfect way to present your work to a group.

Designed for Mobility

Every detail of the 17-inch MacBook Pro has been designed for ultimate versatility and usability. Only 1 inch thin and weighing just 6.8 pounds,[7] it's the thinnest and lightest 17-inch Intel Core Duo–based notebook computer on the market. Whether in the office, at home, at client sites, on the road, or in the air, MacBook Pro gives you the flexibility to work wherever your mobile life takes you.

With built-in AirPort Extreme, MacBook Pro is equipped to connect to a wireless network from almost anywhere and to share the same Internet connection with Mac and Windows-based computers on the network.[4] Integrated Bluetooth 2.0 lets you extend your wireless capabilities even further—providing cable-free connections to Bluetooth devices such as cell phones, PDAs, and Apple's wireless keyboard and mouse.

High-resolution display
The 1680-by-1050 display gives you more than 1.7 million pixels for a spacious visual workspace. Spread out your photos, work on multiple documents side by side, or watch DVDs.

Built-in iSight camera
The iSight camera supports effortless, high-quality video conferencing using iChat AV,[1] as well as fun snapshots with Photo Booth. Or use iMovie HD and iWeb to produce your own video podcasts.[5]

Integrated stereo speakers and microphone
Listen to music and voice through stereo speakers on each side of the keyboard. Use the integrated microphone located under the left speaker grille for audio or video conferences or recording your own podcasts.

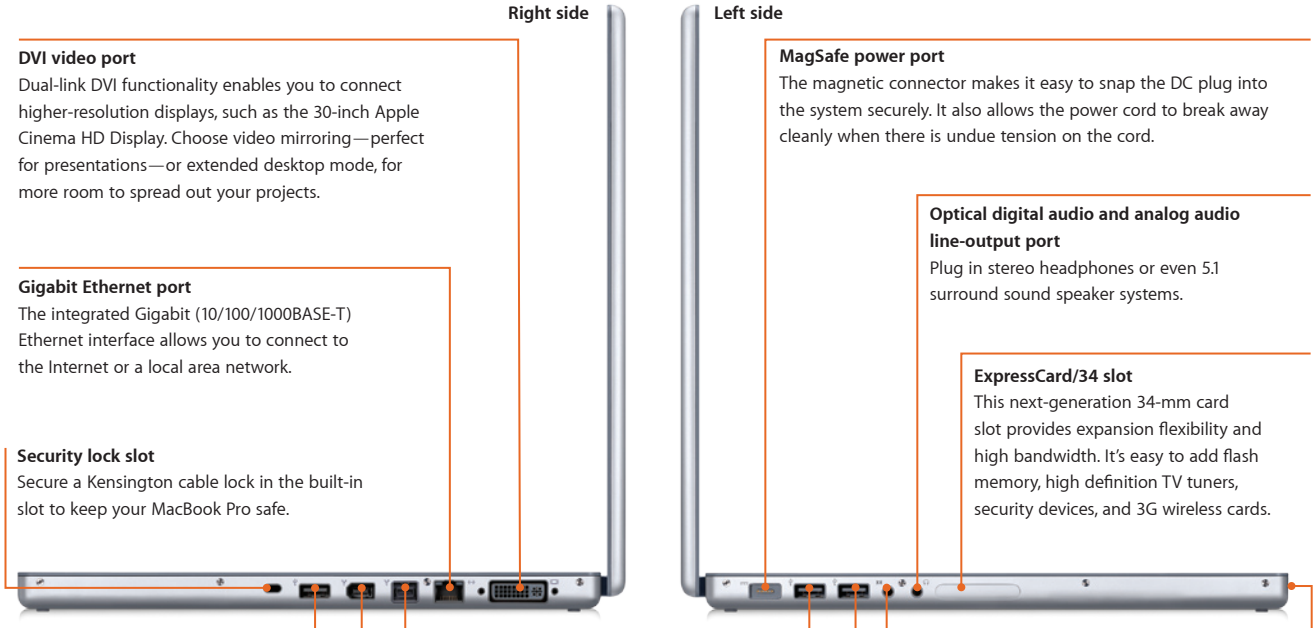
Illuminated keyboard
The backlit keyboard makes it easy to type in low-light situations, such as on an airplane or in a studio environment. Adjust the illumination yourself or let the ambient light sensor control it for you.

IR receiver
With an IR (infrared) receiver next to the display release button, MacBook Pro works with the Apple Remote for controlling your digital content from up to 30 feet away.

Scrolling trackpad
Whether you're browsing web pages or working with large images or spreadsheets, this Apple innovation lets you scroll quickly up, down, or across the active window—just by dragging two fingers across the trackpad.

Advanced digital connections

Connections are quick and easy, because Apple has placed the ports exactly where they should be.



DVI video port
Dual-link DVI functionality enables you to connect higher-resolution displays, such as the 30-inch Apple Cinema HD Display. Choose video mirroring—perfect for presentations—or extended desktop mode, for more room to spread out your projects.

Gigabit Ethernet port
The integrated Gigabit (10/100/1000BASE-T) Ethernet interface allows you to connect to the Internet or a local area network.

Security lock slot
Secure a Kensington cable lock in the built-in slot to keep your MacBook Pro safe.

USB 2.0 port
Plug in your iPod, digital camera, scanner, or printer. For added convenience, the 17-inch MacBook Pro has USB 2.0 ports on both sides, two on the left and one on the right. You can choose which works better for your device.

FireWire 400 and 800 ports
Plug high-speed peripherals such as a camcorder or hard drive into the FireWire 400 and 800 ports. You can also use FireWire target disk mode for fast and easy file transfers.

MagSafe power port
The magnetic connector makes it easy to snap the DC plug into the system securely. It also allows the power cord to break away cleanly when there is undue tension on the cord.

Optical digital audio and analog audio line-output port
Plug in stereo headphones or even 5.1 surround sound speaker systems.

ExpressCard/34 slot
This next-generation 34-mm card slot provides expansion flexibility and high bandwidth. It's easy to add flash memory, high definition TV tuners, security devices, and 3G wireless cards.

Optical digital audio and analog audio line-input port
Connect analog devices as well as state-of-the-art optical digital recording devices.

USB 2.0 ports
Plug in your iPod, digital camera, scanner, or printer. For added convenience, the 17-inch MacBook Pro has USB 2.0 ports on both sides, two on the left and one on the right.

Double-layer-burning SuperDrive
The slot-loading 8x SuperDrive reads and writes a variety of CD and DVD media, including double-layer DVD discs that store nearly twice the amount of images, video, or data—so you can fit more of your work or portfolio on a single disc.

Simple Setup

The 17-inch MacBook Pro is designed to be extremely simple to set up and put to use right away. Just follow these three easy steps.

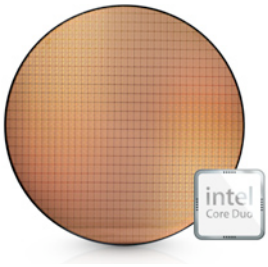
- Plug in the power cord.
- Plug in your Ethernet cable—or go wireless. (To use a dial-up connection, you'll need to purchase the Apple USB Modem.)
- Push the power button, and you're ready to go.

Apple Setup Assistant software opens the first time MacBook Pro starts up. It prompts you to enter the information necessary to set the computer's time, date, and country of use and to set up Internet access.

Setup Assistant retains the information you've entered, so it's not necessary to retype personal data. After setup is complete, you can register your new MacBook Pro with Apple with a single click.

In addition, Setup Assistant walks you through the process of effortlessly moving documents, user accounts, Internet settings, and applications from your existing Mac to your MacBook Pro. The new system will be configured just like your previous one, so you can feel right at home in no time. Upgrading has never been easier, and the transfer is fast using FireWire.

Intel Core Duo Processor



The transistors in the 65-nanometer process have gates measuring a mere 35 nanometers. To put that in perspective, 100 of these transistors could fit inside a human red blood cell.

Performance benchmarks

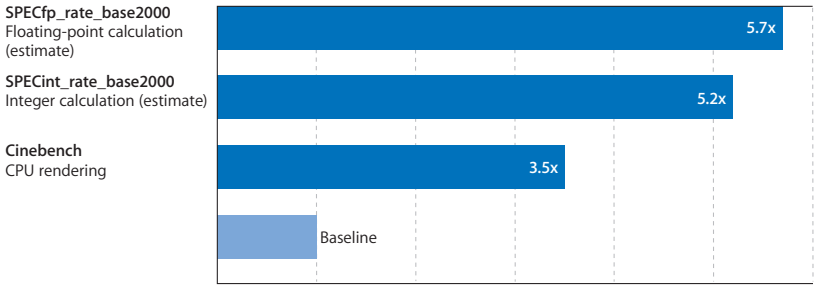
SPEC. SPEC rate metrics recognize multiple-core processors by running multiple copies of the benchmark code concurrently, allowing both cores to work in parallel. SPECfp_rate_base2000 and SPECint_rate_base2000 measure the number of times a system can complete a suite of floating-point- and integer-math-based benchmarks, respectively, over a period of time. The performance of the 17-inch MacBook Pro with the 2.16GHz Intel Core Duo processor is an estimated 5.7 times faster in floating-point calculations than the 1.67GHz 17-inch PowerBook G4 and an estimated 5.2 times faster in integer calculations.

Cinebench. This 3D rendering benchmark based on Cinema 4D has the ability to test the performance of multicore processors. The 2.16GHz 17-inch MacBook Pro performed the Cinebench rendering test 3.5 times faster than the 1.67GHz 17-inch PowerBook G4.

The Intel Core Duo is a groundbreaking processor from the world's most advanced chip manufacturer. As the name implies, the Core Duo packs two execution cores on a single silicon chip, doubling the computational power in the same space as a single-core processor.

The Intel Core Duo boasts an elegant design that enables very high performance with very low energy requirements—making it possible to fit tremendous punch into the svelte 1-inch-thin MacBook Pro. Compared with the 17-inch PowerBook G4, MacBook Pro runs industry-standard processor benchmarks up to five times faster.

Benchmark performance: Up to five times faster than PowerBook G4



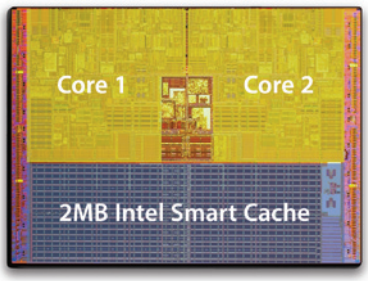
Testing conducted by Apple in April 2006 using preproduction 17-inch MacBook Pro units with 2.16GHz Intel Core Duo; PowerBook systems were shipping units. For the 2.16GHz MacBook Pro system, estimated SPECint_rate_base2000 score is 34.5, and estimated SPECfp_rate_base2000 score is 27.8. See www.spec.org for more information. SPEC benchmarks were compiled using the IBM compiler and a beta version of the Intel compiler for Mac OS. MacBook Pro continuously monitors system thermal and power conditions, and may adjust processor speed as needed to maintain optimal system operation.

Dual-Core Processing

With two processor cores running at 2.16GHz, the 17-inch MacBook Pro can execute multiple data-intensive tasks, each with dedicated processing resources, at the same time. The advanced architecture of Mac OS X detects the Intel Core Duo as two discrete logical processors, each with its own execution resources. This "divide and conquer" strategy divvies up computing tasks across the two cores, so the Core Duo can process up to twice as much work per clock cycle. The result? You'll enjoy new levels of performance across the board, in tasks such as web browsing, video and audio encoding, and manipulation of large photo libraries.

Smart Cache

The Intel Core Duo is the first dual-core processor with a shared L2 cache, which weighs in at an impressive 2MB. The separate cores use Intel Smart Cache technology to share cached data—there's no need to traverse the frontside bus to the system controller. In single-threaded applications, where only one core is in use, the entire 2MB of L2 cache



With 2MB of shared Smart Cache, the Core Duo speeds up processing while conserving wattage.

can be allocated to that core, avoiding the 1MB limitation of a dual-core processor with separate L2 caches. Smart Cache also improves cache coherency by allowing each core to access the same piece of stored data.

Digital Media Boost
Intel Digital Media Boost accelerates data manipulation by applying a single instruction to multiple data at the same time, known as SIMD processing. SIMD technology accelerates vector math operations and floating-point calculations, enhancing performance of 2D and 3D design tasks, video editing, music encoding, digital photography, scientific calculations, and the latest blockbuster games. Digital Media Boost supports Intel Streaming SIMD Extensions (SSE) versions 1, 2, and 3 to enhance integer and floating-point performance.

Industry-Leading Power Efficiency

The Intel Core Duo represents the next generation in high-performance power-efficient microprocessors. An advanced 65-nanometer process design combines with Smart Cache and Dynamic Power Coordination to conserve energy without diminishing performance.

Dynamic Power Coordination technology introduces new energy-saving processor states for fine-tuned power management. Under light load conditions, Enhanced Speedstep technology reduces the processor clock speed to as little as 1GHz at less than 0.8 volt. One core can work at a high performance level, utilizing the full 2MB of L2 cache, while the other core idles independently, saving energy when only a single core is needed.

In addition, Smart Cache boosts performance and saves energy by reducing the number of transactions that the processor sends off the chip to main memory—significantly improving the performance per watt of the entire system. For even greater efficiency, Smart Cache dynamically powers down unused areas of cache when the Core Duo enters the deepest sleep mode.

100 percent native
The version of Mac OS X Tiger that ships with the 17-inch MacBook Pro runs natively on Intel-based Mac systems. This means Mail, Safari, Spotlight, Dashboard, Automator, iChat AV, and all Mac OS X features will take immediate advantage of the two Intel processor cores in MacBook Pro.

Multiple Cores and Mac OS X

Mac OS X is ideally suited to leverage the power of dual-core systems, since it was originally designed for multiple processors. With symmetric multiprocessing, preemptive multitasking, and multithreading capabilities in Mac OS X, Core Duo–based Mac systems deliver impressive performance right out of the box.

With symmetric multiprocessing, Mac OS X dynamically distributes tasks across multiple cores, allowing you to run a processor-intensive task in the background while you work with another application. Mac OS X assigns each task to a different processor core—so the tasks execute simultaneously—and balances the load between cores. Preemptive multitasking further optimizes performance by allowing Mac OS X to prioritize tasks on each core.

Multithreaded applications can take even greater advantage of multiple cores. A multithreaded application can dispatch tasks among several cores at once, achieving up to twice the performance on a dual-core system as it would on a single-core system. Because Apple has been shipping dual-processor Mac systems for more than five years, many popular Mac applications are already multithreaded and able to take immediate advantage of dual-core processing.

As a user, you don't need to worry about symmetric multiprocessing or application threading—you'll just enjoy the enhanced performance.

Developing for the Intel-based Mac
Apple provides a wealth of information to developers who are creating new products or updating existing applications to run on both PowerPC- and Intel-based Mac systems. Intel also provides useful resources for Apple developers, including the Intel C/C++ Compiler for Apple, Intel Fortran Compiler for Apple, Intel Math Kernel Libraries for Apple, and Intel Integrated Performance Primitives for Apple.

For more information about development resources, see developer.apple.com.

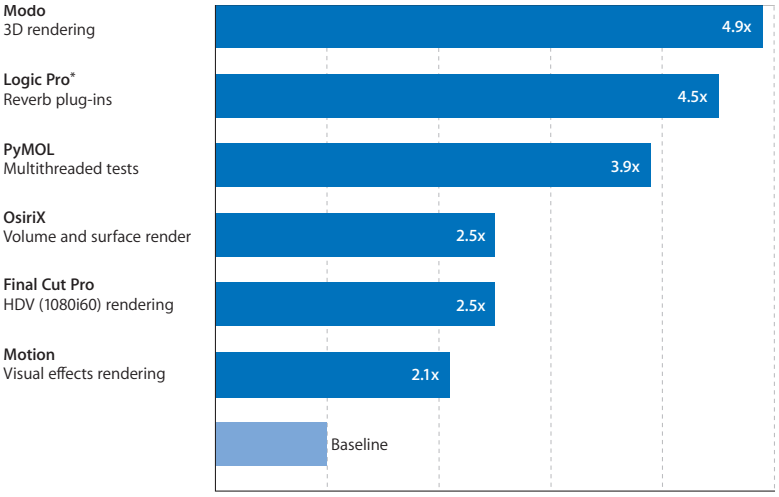
Universal Applications

Mac OS X and the Intel Core Duo processor make an outstanding platform for productivity and creativity—providing excellent compatibility with existing applications and for new Universal applications built to run natively on both PowerPC- and Intel-based Mac computers.

You'll enjoy all the high-performance features of the Intel Core Duo when you use Universal applications.

Application performance: Up to four times faster than PowerBook G4

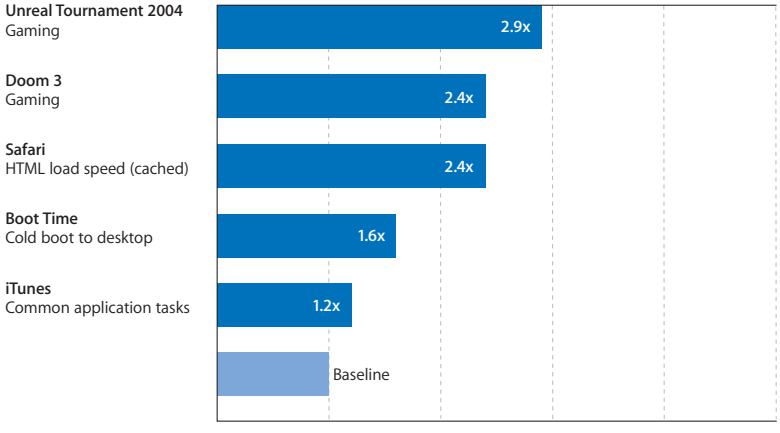
Universal professional applications



Times faster than 17-inch PowerBook G4 with 1.67GHz PowerPC

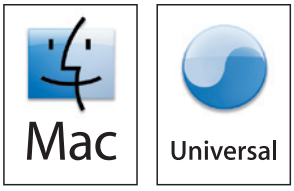
Testing conducted by Apple in April 2006 using preproduction 17-inch MacBook Pro units with 2.16GHz Intel Core Duo; PowerBook systems were shipping units. All systems ran beta versions of Modo. MacBook Pro continuously monitors system thermal and power conditions, and may adjust processor speed as needed to maintain optimal system operation. *On a 2.16GHz MacBook Pro, Logic Pro plays 4.5 times the reverb plug-ins compared to a 1.67GHz PowerBook G4.

Universal consumer applications



Times faster than 17-inch PowerBook G4 with 1.67GHz PowerPC

Testing conducted by Apple in April 2006 using preproduction 17-inch MacBook Pro units with 2.16GHz Intel Core Duo; PowerBook systems were shipping units. Unreal Tournament 2004 benchmark = Bridge of Fate Botmatch. Doom 3 benchmark = Timedemo Demo1. Safari HTML Load Speed (cached) test is a subset of the i-Bench 5.0 benchmark. MacBook Pro continuously monitors system thermal and power conditions, and may adjust processor speed as needed to maintain optimal system operation.



To identify Universal applications, look for the Mac OS X Universal logo on software packages and websites. You can also check the growing list of Universal applications at www.apple.com/universal.

Apple's innovative iLife '06, iWork '06, Final Cut Studio 5.1, Logic Pro 7, and Aperture 1.1 software programs are Universal applications. In addition, leading software vendors—including Microsoft, Quark, and Adobe—have announced plans to release their Mac OS X products as Universal applications.

Rosetta for Seamless Compatibility

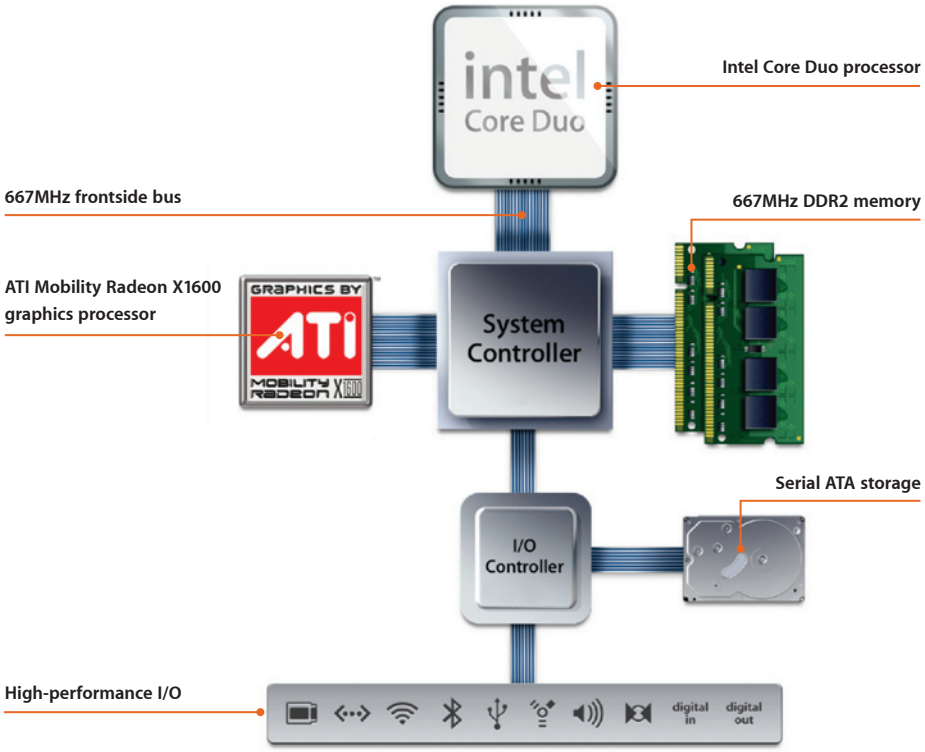
The version of Mac OS X that ships on Intel-based Mac systems includes an innovative Apple translation technology. Called Rosetta, it dynamically translates PowerPC-based Mac OS X applications, including those that require the Velocity Engine. This means that most of the applications that you already have, such as Microsoft Office and Adobe Photoshop, will run on the 17-inch MacBook Pro.[3]

Rosetta is completely transparent and requires no configuration. Just open applications as usual. If the application requires translation, Mac OS X detects it and translates the application using Rosetta.

High-Bandwidth Architecture

Supporting the fast Intel Core Duo processor is an advanced system architecture that includes a 667MHz frontside bus, 667MHz DDR2 memory, 16-lane PCI Express graphics with 256MB of video memory, and a Serial ATA hard drive. This high-bandwidth platform incorporates the latest high-performance technologies without wasting power.

The results are the same, whether you're authoring multimedia presentations, building websites or brochures, manipulating large digital images, or creating and editing high definition video. You'll get fast, unfettered performance from all of your professional applications when they run on the 17-inch MacBook Pro—both at your desk and on the go.



667MHz Frontside Bus

The MacBook Pro system architecture starts with a wide 667MHz frontside bus. Providing high bandwidth—up to 5.4 GBps—between the Core Duo and the rest of the system, it allows large numbers of tasks to run concurrently. This high-performance frontside bus gives the 17-inch MacBook Pro the headroom required by today's demanding professional applications, as well as those you can expect in the future.

667MHz DDR2 Main Memory

Fast 667MHz DDR2 main memory ensures that the Core Duo processor is constantly fed with data without wasting clock cycles. The 17-inch MacBook Pro comes standard with a single SO-DIMM containing 1GB of 667MHz DDR2 SDRAM (PC2-5300), leaving one slot open for future memory upgrades.

This high-speed, high-bandwidth memory architecture enables graphics, video, audio, and other media-rich applications—including your favorite games—to run radically faster. Large files and applications can be loaded into RAM for rapid access by the processor, without having to access system storage.

For a performance improvement when working with large files, two easy-access slots allow you to upgrade your MacBook Pro with up to 2GB of memory. And if both slots are loaded with an equal amount of RAM, you can take advantage of the system's dual-channel memory architecture for an additional performance boost. With a dual-channel memory interface, both banks of SDRAM can be addressed at the same time, achieving memory throughput of up to 10.7 GBps.

PCI Express

MacBook Pro systems use a modern PCI Express architecture that speeds up communication to and from attached devices. Older parallel bus architectures, like PCI, place multiple devices on a single, one-way bus—and all the devices on the bus share the bandwidth. As devices are added, the bandwidth available to each device is reduced, and higher-priority transfers can be slowed by lower-priority data.

In contrast, PCI Express is a serial technology that guarantees each device dedicated bandwidth to and from the system controller. Data can flow upstream and downstream simultaneously. A series of point-to-point, individually clocked "lanes" eliminate contention for the bus. Each PCI Express lane is capable of a 256-MBps data rate in each direction, for a total bandwidth of 512 MBps.

The 16-lane PCI Express graphics bus in the 17-inch MacBook Pro is capable of a 4-GBps data rate in each direction, for a total bandwidth of 8 GBps—eight times the bandwidth of AGP 4X, the graphics implementation in the PowerBook G4. This wide bus supports the high-performance ATI Mobility Radeon X1600 graphics processor with 256MB of dedicated GDDR3 memory, delivering astonishing 3D graphics and effects for next-generation games.

Serial ATA Hard Drive

Serial ATA is the industry-standard storage interface replacing the Parallel ATA interface. Designed to keep pace with the demands of digital video creation and editing, audio storage and playback, and other data-intensive applications, Serial ATA supports a data rate of 150 MBps, 50 percent faster than the 100-MBps Parallel ATA standard in PowerPC G4–based systems.

NCQ support
Native Command Queuing (NCQ) is a new Serial ATA feature that organizes commands to the hard drive in the most efficient order. This means the hard drive performs more sequential reading and writing and spends less time scanning the drive for the correct piece of data. With NCQ support, the hard drive in MacBook Pro reads and writes data faster, while consuming less power.

The 17-inch MacBook Pro comes with a 120GB 5400-rpm Serial ATA hard drive,[8] providing plenty of room to store all of your work plus thousands of high-resolution images, thousands of high-bit-rate audio files, and your latest media productions. For faster access to applications and documents, you can custom-build your MacBook Pro with a 100GB 7200-rpm drive.[8] Not enough? FireWire, USB, and Gigabit Ethernet ports make it easy to plug in multiple devices—or connect to workgroup storage, such as Xserve RAID—for virtually unlimited disk capacity.

Quantum Leap in Bandwidth

The 17-inch MacBook Pro represents a huge performance advance over Apple's previous-generation 17-inch notebook. Compared with the fastest PowerBook G4, the 17-inch MacBook Pro enjoys tremendous throughput across the entire system architecture.

	17-inch PowerBook G4	**17-inch MacBook Pro**
Frontside bus	167MHz 1.3 GBps	667MHz 5.4 GBps
PCI	PCI bus 132 MBps	PCI Express lane 512 MBps
Memory	DDR2 at 333MHz 2.7 GBps	DDR2 at 667MHz 10.7 GBps
Graphics	AGP 4X 1 GBps	16-lane PCI Express 8 GBps
Storage	Parallel ATA 100 MBps	Serial ATA 150 MBps

Leading-Edge Graphics

Creative professionals have always enjoyed an outstanding visual experience on their Mac screens. Now Apple has upped the ante in onscreen performance. Building on the power of Mac OS X, the 17-inch MacBook Pro—with its brighter display, 16-lane PCI Express graphics, and ATI Mobility Radeon X1600 graphics processor—delivers leading-edge graphics capabilities.

Offering more than 1.7 million pixels and wide viewing angles, the 17-inch MacBook Pro has no equal when it comes to visualizing data, whether it's with everyday productivity programs and Internet services or your favorite professional applications. The system's beautiful panoramic display creates a portfolio-friendly work environment that's perfect for designing layouts, websites, and presentations and for editing video, music, and photographic images. To expand visual workspace at the office or to give presentations that dazzle, just connect MacBook Pro to your choice of external displays, TVs, and projectors.[9]

PCI Express–based graphics
The ATI Mobility Radeon X1600 improves graphics performance across the board.

- Advanced Ring Bus memory controller with 128-bit memory interface delivers supercharged graphics performance.
- Ultrathreaded Shader engine supports Shader Model 3.0 programmable vertex and pixel shaders.
- High-precision floating-point operations provide High Dynamic Range (HDR) rendering for greater visual realism.

ATI Mobility Radeon X1600 Graphics Processor

The combination of a 16-lane PCI Express architecture and the ATI Mobility Radeon X1600 graphics processor brings a new level of realism to Mac notebook users. The 256MB of dedicated GDDR3 memory ensures that you'll experience sharp video and photos, smooth video playback, astonishing effects, and vibrant colors—as well as incredible, texture-rich 3D performance in next-generation animation and games.

High-Resolution Display

A thing of beauty that rivals most desktop monitors, the 1680-by-1050-pixel 17-inch MacBook Pro display is 36 percent brighter than the 17-inch PowerBook G4 display. This increase, immediately visible, gives you a consistent viewing experience when using dual-display mode with an Apple Cinema HD Display.

You can see onscreen work without having the computer directly in front of you, thanks to wide viewing angles of 130 degrees horizontal and 100 degrees vertical. With a minimum of color shift, the display can be viewed from either the side or the top. This can be particularly helpful in small-group situations where some people may need to view the display off-angle.

External Display Support

Featuring a compact footprint and an elegant aluminum design, an Apple Cinema Display is the ideal match for the 17-inch MacBook Pro. The DVI video interface transfers pure digital signals from computer to display.

Dual-link DVI functionality effectively doubles the bandwidth of the video signal from your notebook to an external display, increasing both speed and signal quality. Increased transmission power combined with 256MB of dedicated graphics memory lets you connect higher-resolution displays—such as the 30-inch Apple Cinema HD Display (with 2560-by-1600-pixel resolution)—directly to MacBook Pro.

Video output options

In addition to the latest DVI displays, the 17-inch MacBook Pro connects to virtually any external display you may have, thanks to the computer's comprehensive video support.

- **DVI.** This port provides the highest image quality for video output. With a pure digital connection from the graphics processor to a DVI-equipped display or projector, it eliminates the degradation inherent in converting a digital signal to analog. Hot-plug capability means that MacBook Pro recognizes and begins displaying content on an external monitor as soon as it is connected to the DVI port.
- **VGA.** Use the included DVI to VGA adapter to connect analog monitors and projectors or analog-based flat panels. Hot-plugging is also supported with VGA devices.
- **ADC.** Use the Apple DVI to ADC Adapter (sold separately) to connect Apple flat-panel displays that have an ADC connector.
- **S-video or composite video.** Connect to many standard televisions, VCRs, or projectors using the Apple DVI to Video Adapter (sold separately). This gives professors and students the ability to present reports, projects, and even websites to an entire class or group on a television screen. At home, you can attach your MacBook Pro to a TV to watch DVD movies. The computer can detect the TV without the need to restart; simply press the Command (⌘) key along with the Brightness Up (F2) function key, and the system sends the video to the external monitor.

Viewing modes

The 17-inch MacBook Pro supports an external display in three modes. Each mode can be used with any of the video output options.

- **Extended desktop.** Extended desktop mode lets you distribute work across two displays. This gives you more room for viewing rich content, using complex applications with floating palettes and long timelines, or keeping many applications open at once.
- **Video mirroring.** Video mirroring mode outputs the same information on both displays. So, for example, you can control a presentation from the notebook's display while your audience watches it on a second display or as a projected image. You can also use this feature to face your audience during the presentation. With hardware-based mirroring in MacBook Pro, video content such as QuickTime movies can play on an external monitor with performance equal to that of the built-in display.
- **Lid-closed operation.** You can also opt to use MacBook Pro with its full video memory applied to an external display. To activate this feature, put the computer to sleep by closing the lid and wake it through an external keyboard, such as the Apple Wireless Keyboard. Lid-closed operation is ideal when you want to achieve maximum performance on a high-quality external display or to keep your workspace neat and organized.

Switching modes
To toggle between extended desktop and video mirroring modes, simply press the F7 function key. Alternatively, you can select the mode using the Displays pane in System Preferences.

Built-in iSight Camera

An iSight video camera and microphone are conveniently integrated into the 17-inch MacBook Pro enclosure, making it easier than ever to hold a video conference with iChat AV, take snapshots in Photo Booth, or create a video podcast using iMovie HD and iWeb.[5] No costs, cables, or complicated setup procedures are required to get started with iSight. Just open the application you want to use and you'll be ready for your close-up.

Video Conferencing with iChat AV

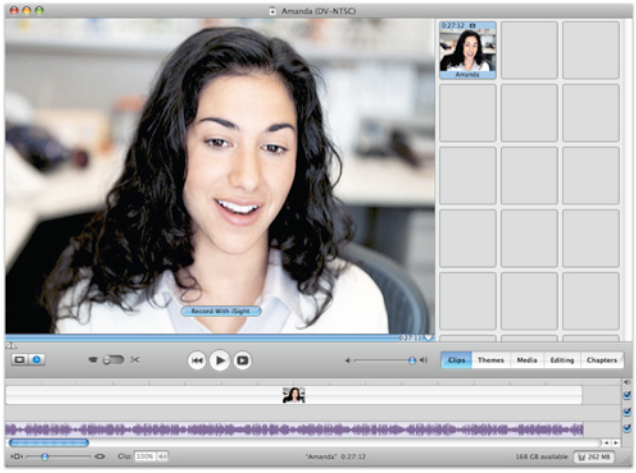
With iChat AV and the high-quality 640-by-480-pixel iSight, you can start or join a video conference at a moment's notice.[1] Just open iChat AV, click the video icon for the colleague you want to talk with, and start your face-to-face conversation.

You can conference with up to three other people at once in a three-dimensional view. It feels like the other parties are right in the room with you. And because iChat AV is a feature of Mac OS X Tiger, it works seamlessly with the built-in iSight and Core Duo processor to bring you stunning, true-to-life picture quality and crystal-clear conversation.

Starting a video conference is as easy as clicking the iChat icon and choosing your participants.

Recording Video with iMovie HD and iWeb

Using iSight as an input source for iMovie HD, you can create quick videos complete with titles and effects. Then with iWeb, the newest member of the iLife family, you can effortlessly publish your movies to the Internet as video web pages, video blogs, or video podcasts.[5] You can add chapter markers and web addresses to your movies, enabling subscribers to access their favorite parts and find more information on the web. And since iSight is built into every MacBook Pro notebook, you don't have to hook up an external video camera each time you want to record a quick message. Just open iMovie, look into iSight, click Record, and start talking.



iMovie HD makes authoring video podcasts as easy as any iMovie project.

Add any of 16 fun and interesting effects to your Photo Booth snapshots.

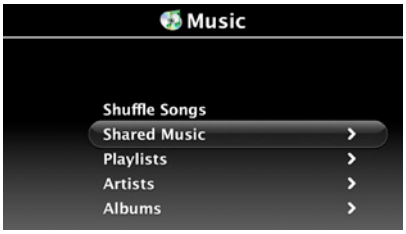
Snapshots with Photo Booth

With iSight and the included Photo Booth software, taking snapshots is completely effortless. Just open Photo Booth from the Dock, click the camera button, and pose for a picture. You'll hear the countdown, see the screen flash, and watch as your photo instantly appears in the thumbnail viewer. Take as many photos as you want, keep the ones you like, and delete those you don't. Photos are saved automatically, so you can review them right away or browse them later. When you're done, you can send your photos via email, add them to your iPhoto library, or choose one as your Address Book or Buddy picture.

Front Row Media Experience

Every MacBook Pro comes with Front Row software—with its intuitive menus, large text, and brilliant graphics—and the Apple Remote for controlling and sharing music, photos, and videos from up close or across the room. You no longer have to be at your computer to turn up the volume of your music performance in iTunes, move backward or forward in your iPhoto slideshow, pause your latest DVD movie mid-scene, or skip to the next scene of your new music video. You can even use the Apple Remote to navigate your Keynote presentations.[6] Avoiding all the fuss and clutter of external signal receivers, the Apple Remote works with a built-in IR (infrared) receiver located next to the MacBook Pro display release button.

Not only can you enjoy all of the digital media on MacBook Pro, but Bonjour sharing also makes it possible to access shared iTunes music and video playlists and iPhoto albums from other computers on your network through Front Row. And since Front Row is integrated with Bonjour, you can view shared digital media just as if it were on your MacBook Pro.



Front Row

The four Front Row menus allow you to manage the following digital media.

- **Music.** Front Row makes finding and listening to your iTunes music as simple as using an iPod. It gives you access to all of the music, podcasts, and audiobooks in your iTunes library—and even shows album art on the 17-inch MacBook Pro display while your selection is playing. Use the Apple Remote to scroll through albums, artists, and playlists, select the songs you want to hear, adjust the volume, or pause a song from anywhere in the room. You can also access shared iTunes playlists over your network, no matter which computer—Mac or PC—your music library is on.
- **Photos.** Front Row gives you access to all of your iPhoto photo albums and lets you play a slideshow of the photos in any album you choose. When you select a photo album, Front Row displays a preview of three images from the album so you can decide whether to open it or choose another album. It also keeps track of the music and transition settings of slideshows created in iPhoto. If you are listening to music

Keyboard controls
In addition to using the Apple Remote, you can control Front Row from your keyboard. The following keys are equivalent to the buttons on the remote:

- Command-Esc: Enter Menu (launch Front Row)
- Esc: Exit Menu (Menu back)
- Space or Return: Select/Play/Pause
- Up Arrow: Volume/Menu Up
- Down Arrow: Volume/Menu Down
- Left Arrow: Next/Fast-forward
- Right Arrow: Previous/Rewind

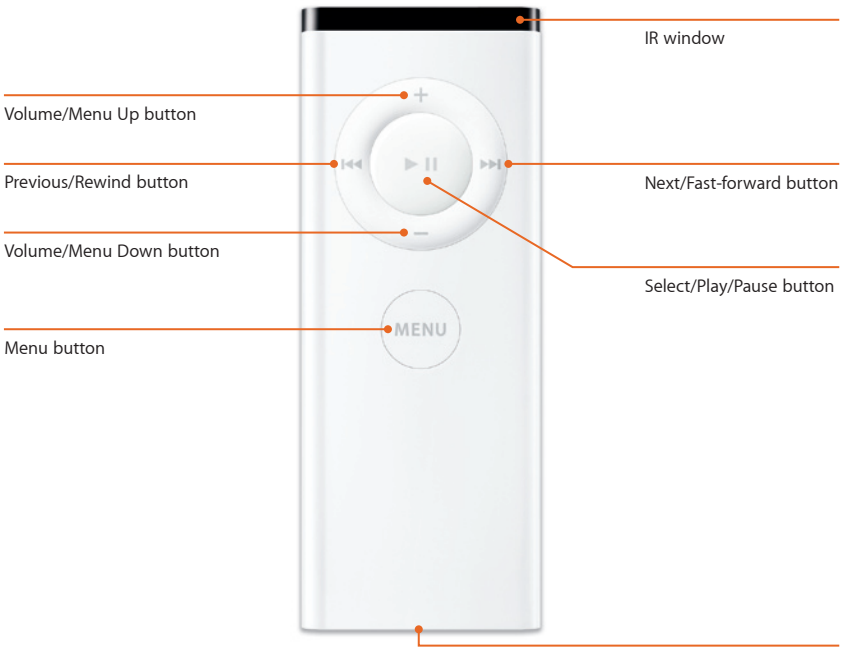
in iTunes and decide to watch a photo slideshow that has been set up with music, Front Row stops playing your iTunes music. Just as with your music, you can access shared iPhoto albums on other Mac computers over your network.

- **Videos.** With Front Row you can easily select and play your favorite video content. Access iTunes videos, including purchased TV shows and music videos, and video podcasts.[10] You can also watch QuickTime movies in your Movies folder as well as movie trailers. The movie trailers menu displays the most recent trailers on the QuickTime Movie Trailer site, complete with title, artwork, and rating. With iTunes sharing enabled, you can even access videos on other Mac and Windows computers over your network.
- **DVDs.** Front Row simplifies the DVD experience by giving you full control of all DVD functions through the six buttons on the Apple Remote. Bringing up the main Front Row menu while playing a DVD pauses the DVD, fades the current frame into the background, and adds a virtual chapter marker for easy access to that spot when you resume watching the movie. Now you can sit back and relax while you're watching a DVD on your MacBook Pro, instead of having to get up every time you want to pause, fast-forward, or rewind.

Apple Remote

The Apple Remote is an IR device with just six buttons. The remote's powerful signal works from up to 30 feet away, and often you won't even need to point it in the direction of your MacBook Pro. If there is more than one Mac with Front Row in the room, you can pair each Apple Remote to a specific computer so that the signals never cross.

Using the Apple Remote



Actual size

You can also use the Apple Remote to put MacBook Pro to sleep and wake it, no matter where you are in the room. To save battery power when it's not in use, the remote goes to sleep automatically and then wakes up with the press of a button. Under regular use, the battery should last up to two years. If the battery starts to run low, you'll know ahead of time, because a low-battery indicator appears onscreen.

Controlling Keynote presentations

Use the Apple Remote to conveniently control Keynote presentations on your MacBook Pro.[6] No need to be chained to the podium. Get up and move around, making points forcefully as you engage classes, colleagues, and clients from anywhere in the room. Combine this feature with an external display or projector for a knockout performance.

Press this button	In a presentation	In the slide organizer
▶❚❚	To freeze/unfreeze	To jump to selected slide
MENU	To invoke slide organizer	To exit slide organizer
MENU (Press and hold)	To exit	To exit presentation
⏮	To move to previous slide	To select previous slide
⏮ (Press and hold)	To jump to first slide	
⏭	To move to next slide	To select next slide
⏭ (Press and hold)	To jump to last slide	
+	To increase volume	To increase volume
−	To decrease volume	To decrease volume

High-Performance I/O

Apple's flagship notebook computer, the 17-inch MacBook Pro provides Gigabit Ethernet, FireWire 800, DVI, optical digital audio, and an ExpressCard/34 slot—all the advanced I/O capabilities that a mobile professional could hope for. Every system also comes with a double-layer-burning SuperDrive. This slot-loading 8x-speed drive puts state-of-the-art data archiving and media creation at your fingertips, wherever you are and whatever type of work you're doing, whether it's live concert recording, genetics research number crunching, or on-location motion picture editing.

ExpressCard/34 Slot

Replacing the PC Card bus, the next-generation ExpressCard/34 interface provides expansion flexibility, delivering greater bandwidth in a smaller (34-mm) slot. With data transfer rates of up to 256 MBps in each direction, the ExpressCard interface transfers data four times faster than the PC Card interface in PowerBook G4 notebooks. Current ExpressCard modules include flash memory adapters, external SATA II interfaces, and additional USB or FireWire ports. EVDO wireless communications, FireWire 800 ports, and TV tuners are also expected to be available in the ExpressCard/34 format. ExpressCard media can be ejected whether MacBook Pro is on or off. To eject when the computer is running, simply drag the card's icon to the Trash and push the card gently to activate the spring.

DVI Output

The DVI port provides the highest image quality for video output. With a pure digital connection all the way from the graphics processor to a DVI-equipped display or projector, it eliminates the degradation inherent in converting a digital signal to analog. Hot-plug capability allows MacBook Pro to recognize and begin displaying content on an external monitor as soon as it is connected to the DVI port.

Gigabit Ethernet

The 17-inch MacBook Pro features Gigabit (10/100/1000BASE-T) Ethernet, automatically switching to the speed of the connected Ethernet network. Just plug the computer into an Ethernet network, DSL modem, or cable modem, and you can transfer files or browse the Internet immediately.

Speaking of easy Internet connections, Mac OS X automatically finds the best way to connect to the network wherever you take your computer. You don't have to continually set and reset complex network options every time you move to a new location. A feature called "multihoming" in Mac OS X determines the best connection type based on your location, so each network interface needs to be configured only once.

Disc burning built in
You can burn a CD or data DVD directly from the Finder. Just drag the files to the disc and eject it. Mac OS X burns the disc before ejecting it from the drive.

8x Double-Layer-Burning SuperDrive

The 17-inch MacBook Pro comes standard with DVD-burning capability through the built-in slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW), which can read and write to a variety of DVD and CD media including DVD-R, DVD+R, DVD-RW, DVD+RW, CD-R, and CD-RW discs. The 8x-speed SuperDrive enables you to burn up to 8.5GB to one double-layer DVD+R disc, and it works with the integrated iLife applications to give you the easiest way to create high-quality CD and DVD content. You can use iDVD to organize your work and create a digital portfolio on DVD—or burn your movies or images to a disc that can be played in almost any consumer DVD player.

Quick and easy data transfer
Using target disk mode, it's easy to transfer large files between another computer and your MacBook Pro. Turn the other computer off and connect it to MacBook Pro with a FireWire cable. Then turn the other computer on, holding down the "T" key until the FireWire icon appears. As soon as the hard drive icon for the other computer appears on your MacBook Pro desktop, you can copy all the files you need. When you're done, simply select the hard drive icon and choose Eject from the File menu of MacBook Pro. Switch off the other computer, then disconnect the FireWire cable.

FireWire 400 and 800

Ideal for professional applications demanding high-speed connections, such as video editing and broadcast streaming, the 17-inch MacBook Pro features both a 6-pin FireWire 400 port supporting data transfer rates up to 400 Mbps and a 9-pin FireWire 800 port with rates up to 800 Mbps.[11] The FireWire 800 port also supports FireWire 400 devices using a 9-pin-to-6-pin cable (sold separately). Up to 63 FireWire devices can be daisy-chained together from one FireWire port. These powered ports enable connections to bus-powered devices, such as FireWire hard drives, which can run directly from the computer's power without the need for an external power adapter.

USB 2.0

The 17-inch MacBook Pro features three 480-Mbps USB 2.0 ports that can support up to 127 devices at the same time. You can use these industry-standard ports to connect with plug-and-play convenience to printers, keyboards, mice, storage devices, laboratory instruments, iPod, digital cameras, and 3G wireless solutions. Designers can connect devices such as graphics tablets or scanners, and musicians can attach the latest professional audio devices. Because USB 2.0 is compatible with USB 1.1, you can continue to use older USB peripherals without the need for cable adapters.

Hear the big picture
With twice the number of speakers, larger speaker enclosures, and increased total power, MacBook Pro delivers double the sound and plays more low frequencies than the 17-inch PowerBook G4.

Audio

Delivering enviable audio performance with new and powerful stereo speakers, the 17-inch MacBook Pro gives more dimension to presentations, music, movies, simulations, and games. The integrated omnidirectional microphone (located under the left speaker grille, above the keyboard) lets you take advantage of speech recognition in Mac OS X or use Internet telephone applications without any additional wires or hardware—making it easier to travel light.

MacBook Pro systems feature two standard 16-bit audio minijacks: one for line in and optical digital input and the other for headphone out and optical digital output. The optical digital audio ports make it easy to connect MacBook Pro to professional decks, receivers, digital instruments, and 5.1 surround sound systems. Because optical digital audio transmits data as impulses of light rather than electrical signals, it enables true noise-free, pristine sound—eliminating troublesome ground loops and ensuring higher audio and signal quality.

Unique Mobile Design

From its efficient Intel Core Duo processor to its brilliant display and integrated wireless technologies, the 17-inch MacBook Pro is ready to work however you want and wherever you go. Every tiny detail has been designed for ultimate usability. Only 1 inch thin and weighing just 6.8 pounds,[7] it's the thinnest and lightest 17-inch Intel Core Duo–based computer on the market. With more high-performance features than ever, it's also the ideal combination of form and function in a professional notebook computer.

Thin, Light Aluminum Enclosure

For the perfect balance of weight, strength, and durability, Apple uses an aluminum alloy for the MacBook Pro enclosure. Approximately one-third the weight of steel but with a superior strength-to-weight ratio, aluminum is the material of choice in performance design, from motorcycle and bicycle frames to aircraft parts and car engines.

To create the enclosure, the aluminum alloy is cold-rolled and work-hardened for added strength. After final forming, it undergoes a special anodizing process to harden and protect the surface against stains, scratches, and discoloration. The result is an enclosure that is lightweight, durable, and modern.

Further enhancing their durability, MacBook Pro notebooks feature a lightweight internal frame for superior stiffness and shock resistance. The hard drive is rubber-mounted to the frame, providing additional protection for your valuable data.

Instant On
The Instant On feature enables MacBook Pro to wake from sleep in less than a second, so it's ready to work when you are.

MagSafe Power Adapter

Each notebook computer from Apple has set new standards of excellence and placed Apple at the forefront of design for the mobile lifestyle. Among the innovations brought by MacBook Pro is the MagSafe Power Adapter.

The connector on the MagSafe Power Adapter guides the plug into the power port magnetically for a quick and sure connection, making it easier than ever to charge the system's battery. When the connection is secure, an LED at the head of the plug lights orange to indicate that your MacBook Pro is charging its battery or green to signal that the battery is fully charged.

The MagSafe power connector also disconnects easily the moment there is sudden strain—preventing the cord from tripping someone and sparing the computer from a destructive fall. At the same time, this feature safeguards the power cord against fraying or weakening over time.

Illuminated Keyboard

Professionals use notebook computers everywhere these days, often in low-light conditions where it's difficult to see the keyboard. To help visibility, Apple equips MacBook Pro systems with a backlit keyboard. Unlike other keyboard lighting solutions, which shine a light down onto the keys (so the light ends up on the user's hands), the illuminated keyboard on the 17-inch MacBook Pro is lit from the bottom. This is particularly useful on nighttime airplane trips or in studios or lecture halls with dimmed lighting. In these and other low-light situations, you can activate and adjust the keyboard illumination yourself or let the computer control it with the integrated ambient light sensor.

Ambient Light Sensor

Continuing the tradition of innovations that make Apple products easy to use and optimized for mobility, the MacBook Pro illuminated keyboard includes a built-in ambient light sensor. This sensor monitors surrounding light levels and adjusts the brightness of the screen backlight and keyboard illumination accordingly.

When light levels drop, the computer lowers the brightness of the display and the keyboard illumination comes on, so you can see the keys clearly and continue to work. Conversely, when light levels increase, MacBook Pro increases the display brightness and turns off the keyboard backlight.

Scrolling Trackpad

When you're browsing web pages or working with large documents, images, or spreadsheets, you are constantly moving around in the application window. The innovative scrolling trackpad capability on MacBook Pro systems makes navigation and scrolling within a window fast and convenient. The 17-inch MacBook Pro ships with this ease-of-use feature already activated. By dragging two fingers anywhere across the trackpad, you can quickly pan up, down, or across the active window. It's easy to customize these settings—or, if you prefer, turn them off completely—through System Preferences.

AirPort Extreme

Your own portable network
Carry an AirPort Express Base Station when you travel and you can access the Internet from anywhere in your hotel room. Just plug the base station into a convenient power outlet and connect it to the Ethernet jack using an Ethernet cable. Start up your MacBook Pro and you're ready to surf.

AirPort Extreme wireless technology is built into every MacBook Pro, giving you instant access to wireless networks and the freedom to connect wherever you are. Based on the IEEE 802.11g standard, AirPort Extreme supports data rates up to 54 Mbps.[4] That means your 17-inch MacBook Pro can exchange data on an 802.11g network almost five times as fast as on an 802.11b network. AirPort Extreme is also compatible with Windows PCs and with the millions of Wi-Fi Certified 802.11b devices in use around the world. So even if your environment includes Windows PCs, you'll be able to access your company's wireless network, check email wherever there's a wireless hot spot, and do scientific or academic research around your institution's campus.

Beyond providing wireless Internet access, Apple's AirPort Extreme Base Station—for use with AirPort Extreme and 802.11b and 802.11g devices—is loaded with advanced features, such as wireless sharing of a USB printer, wireless bridging of AirPort Extreme or AirPort Express Base Stations, and other options to increase the range of your network. It supports up to 50 simultaneous users, Mac and PC, all sharing a single Internet connection.[4]

Apple's AirPort Express Base Station allows up to 10 Mac and Windows users to wirelessly share an Internet connection, stream their iTunes music library to a stereo or set of powered speakers, print to a USB printer, or extend the wireless range of an AirPort Extreme Base Station.[12]

Bluetooth 2.0 + EDR

MacBook Pro systems feature integrated Bluetooth 2.0 with Enhanced Data Rate (EDR) for wireless connection with Bluetooth-enabled devices—such as PDAs, mobile phones, wireless headsets, HCRP-supported printers, and other Bluetooth-equipped computers—without requiring a direct line of sight between devices and with a bandwidth of up to 3 Mbps. Bluetooth was designed to connect to multiple devices simultaneously, so you can use the Apple Wireless Keyboard and the Apple Wireless Mouse at the same time. Every MacBook Pro comes ready to connect wirelessly to Bluetooth-enabled peripheral devices within a radius of 30 feet.

With the included iSync software, you can easily synchronize contact information and other data between your MacBook Pro, mobile phone, and Palm OS–based PDA. You can also enjoy cable-free connections between your computer and your Palm hand-held. Use the Bluetooth File Exchange application to transfer files between your system and another Mac or a Windows computer. Or use a camera phone to send images to your MacBook Pro, put them in an email, and send them instantly over the phone's GPRS connection.

Using the Bluetooth technology in MacBook Pro, a Bluetooth-enabled GSM/GPRS mobile phone can even act like a cellular modem in your pocket. As mobile phones begin to access the Internet at broadband speeds, the 3-Mbps Bluetooth capability will give you the optimum foundation to take advantage of this greater bandwidth.

Sudden Motion Sensor

You expect your notebook computer to go where you go. The information stored on its hard drive can range from critical business information to priceless personal files—making protection of data on the hard drive a must-have feature. The Sudden Motion Sensor helps to detect an accidental drop or fall by sensing accelerated movement and a sudden change in the axis position of MacBook Pro. In the event of a drop or fall, the Sudden Motion Sensor instantly parks the hard drive heads so they won't scratch the disks on impact. This lessens the risk of damage to the drive and helps increase the chance that you will be able to retrieve your valuable data. When the Sudden Motion Sensor detects that the computer's position is once again level, it unlocks the hard drive heads, and normal operation can resume.

Bundled Software

MacBook Pro and Mac OS X Tiger team up to deliver an unsurpassed computing experience for creative professionals. Mac OS X provides unparalleled stability and performance. Innovations in such areas as graphics and media, user interface, networking, cross-platform interoperability, and security make it the ideal base for Apple's best-in-class applications including Spotlight, Dashboard, Automator, and iChat AV.

In addition, Mac OS X is the foundation for Apple's integrated iLife applications: iPhoto, iMovie HD, iDVD, GarageBand, iWeb, and iTunes. Device drivers are preinstalled, so you can use today's most popular USB and FireWire digital devices right away. Simply plug in a digital camera, camcorder, or iPod, and MacBook Pro automatically recognizes it.

Secure by design
Central to the design of Mac OS X is a security strategy that emphasizes the adoption of industry standards, open software development, rapid response measures, and a modern security architecture—ensuring that every Mac is safe and secure.

- The keychain makes it easy to manage and safeguard your passwords and permissions.
- FileVault protects your data using strong AES-128 encryption.
- An integrated VPN client gives you secure access to networks over the Internet.
- A powerful firewall secures your network.

Mac OS X Tiger

Change the way you work, play, search, and share on a Mac. Mac OS X Tiger includes the following:

- **Spotlight.** Search and find virtually anything, anywhere on your computer as quickly as you type. Files, images, email, contacts, calendars, and applications appear instantly.
- **Dashboard.** Dashboard zooms onto your desktop with the click of an icon and disappears just as quickly. Use it to access mini-applications called widgets.
- **Safari RSS.** The world's fastest web browser for the Mac, Safari features built-in RSS support. Scan the latest news, information, and articles from thousands of websites in one easy-to-read, searchable article list.
- **Automator.** Working like a robot inside your computer, this personal automation assistant helps you streamline repetitive manual tasks without programming.
- **iChat AV.** In Tiger, iChat AV brings multiway video and audio conferencing to your desktop with stunning, true-to-life pictures and crystal-clear communication.[1]
- **QuickTime.** Apple's award-winning multimedia software includes user-friendly controls and pristine H.264 video. Upgrade to QuickTime Pro and capture your own movies, then share them via email or .Mac.[13]
- **Mail.** Take control of your correspondence with Mail, featuring Spotlight search technology. Find email instantly and accurately, organize messages using Smart Mailboxes, and share, save, or view emailed images using the slideshow feature.

Windows compatibility
With Mac OS X Tiger, Mac systems and PCs can easily share files, networks, and even peripherals—including printers, scanners, and cameras. Tiger supports the same standards used in Windows and Microsoft-specific technologies, enabling compatibility with Active Directory and Microsoft Exchange mail servers.

- **.Mac Sync.** Now built into Mac OS X preferences, .Mac Sync makes staying up to date simple. Sync information from your favorite applications to multiple Mac computers and your .Mac account seamlessly.[13]
- **VoiceOver.** The spoken English interface to Mac OS X, VoiceOver provides a new way for those with visual disabilities to access the Mac through speech, audible cues, and keyboard navigation.
- **Parental controls.** Protecting kids from undesirable information as they surf the Internet and use the computer's mail, search, and chat features, parental controls make Mac OS X a powerful, family-friendly operating system.

Look for more information about Mac OS X on the web at www.apple.com/macosx.

iLife '06

Apple's iLife '06 suite of digital lifestyle applications includes the best tools available on any platform for creating, organizing, and editing digital media. They give you more ways than ever to pursue your professional goals and enjoy the digital life. iLife now includes iWeb, an innovative application that lets you share photos, movies, podcasts, and blogs on the Internet in minutes using .Mac.[5] And with Front Row and the Apple Remote, you have exciting new capabilities for presenting original work to colleagues and clients, as well as sharing personal digital creations with friends and family. From composing music to scrolling through slideshows, iLife and the 17-inch MacBook Pro provide the perfect platform for your creative projects.

iPhoto: Share photos in a whole new way
The easiest way to import, organize, edit, and share your digital photos, iPhoto offers blazing-fast support for 250,000 of them. Photocasting, one-click iWeb publishing with .Mac, and custom calendars and cards guarantee that no one will miss a single smile.[14]

iMovie HD: Turn video into home cinema
Give yourself the green light with iMovie HD featuring Apple-designed movie themes. Create Hollywood-style movies using full-screen editing, new audio tools, and real-time Core Video effects—then share them online with one-click iWeb publishing using .Mac.[5]

Apple and third-party software
In addition to iLife '06, every 17-inch MacBook Pro comes with the following software:

- Apple iWork 30-Day Trial
- Microsoft Office 2004 for Mac Test Drive
- Intuit QuickBooks for Mac New User Edition
- FileMaker Pro Trial
- Comic Life
- OmniOutliner

iDVD: Create stunning DVDs
Author and burn movies, photos, and music to widescreen DVDs. From instant gratification with Magic iDVD to next-generation themes, iDVD makes it easy. For your convenience, iDVD supports an array of third-party DVD burners in addition to Apple's SuperDrive.

GarageBand: Record your next hit show
The best way to record music on a Mac is also the best way to record podcasts. Podcasting in GarageBand puts you in the control room of your own full-featured radio station. And iWeb integration gets your voice on the Internet in minutes.[5]

iWeb: Put your life on the web
Use iWeb to create websites and blogs—complete with podcasts, photos, and movies—and get them online fast. With the newest member of the iLife family, you can just drag, drop, and design using your choice of web templates, then publish to your .Mac web page.[5]

iTunes: The best digital jukebox for music and video
iTunes is the easiest way to discover, organize, and listen to audio on your computer.[10] Manage your music or watch music videos. Catch the hottest TV shows. Create playlists for every activity, burn them to CD, or download them to your iPod.

Configurations and Options

Standard Configuration

Apple offers 17-inch MacBook Pro systems to meet the needs of a wide variety of creative professionals, including media producers, designers, copywriters, photographers, videographers, educators, musicians, scientists, engineers, researchers, architects, and finance and accounting consultants. The following standard configuration is available through the Apple Store and Apple Authorized Resellers.

Order number	**MA092LL/A**
Processor	2.16GHz Intel Core Duo
L2 cache	2MB shared
Frontside bus	667MHz
Main memory	1GB (single SO-DIMM) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 2GB
Hard drive	120GB Serial ATA (5400 rpm)[8]
Optical drive	Slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW)
Display	17-inch (diagonal) TFT widescreen; 1680 by 1050 pixels
Graphics support	ATI Mobility Radeon X1600 with 256MB of GDDR3 SDRAM and dual-link DVI support
Video camera	Built-in iSight
Expansion	ExpressCard/34 slot
Ports	FireWire 400 port, FireWire 800 port, three USB 2.0 ports
Wireless networking	Built-in 54-Mbps AirPort Extreme (802.11g)[4]; built-in 3-Mbps Bluetooth 2.0 + EDR
Ethernet	10/100/1000BASE-T (Gigabit)
Video	DVI output, VGA output
Audio	Built-in stereo speakers, built-in microphone, optical digital input/line in, optical digital output/headphone out
Keyboard	Full size; backlit with ambient light sensors
Software	Mac OS X, Front Row, Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iLife (includes iPhoto, iMovie HD, iDVD, GarageBand, iWeb, and iTunes), iCal, Photo Booth, DVD Player, iWork 30-Day Trial, Comic Life, FileMaker Pro Trial, Microsoft Office 2004 for Mac Test Drive, OmniOutliner, QuickBooks for Mac New User Edition, Xcode Development Tools, Apple Hardware Test, and more
Service and support	90 days of toll-free telephone support and one-year limited warranty
Also included	Apple Remote, DVI to VGA adapter, MagSafe Power Adapter, AC wall plug, power cord

Configure-to-Order Options

You can order a custom-configured MacBook Pro from the Apple Store or an Apple Authorized Reseller. Options may include additional RAM, a faster hard disk drive, additional batteries and power adapters, an AirPort Extreme or AirPort Express Base Station, Apple flat-panel displays, external keyboards and mice, and third-party peripherals.

Apple Displays and Adapters

To extend your MacBook Pro system, you can choose from Apple's family of all-digital, flat-panel displays.

- Apple Cinema Display (20-inch), order number M9177LL/A
- Apple Cinema HD Display (23-inch), order number M9178LL/A
- Apple Cinema HD Display (30-inch), order number M9179LL/A

In addition, the following display adapters are available:

- Apple DVI to ADC Adapter, order number M8661LL/B (required to connect Apple flat-panel displays that have an ADC connector)
- Apple DVI to Video Adapter, order number M9109G/A (required for S-video or composite connections)

Other Products

These products are available to enhance your MacBook Pro system.

- AppleCare Protection Plan, order number M8853LL/B
- Apple USB Modem, order number MA034Z/A
- 85W MagSafe Power Adapter, order number MA357LL/A
- 17-inch MacBook Pro Rechargeable Battery, order number MA458LL/A
- AirPort Express Base Station, order number M9470LL/A
- AirPort Extreme Base Station with modem and antenna port, order number M8799LL/A
- AirPort Extreme Base Station with Power over Ethernet support and UL 2043 conformance, order number M9397LL/A
- Apple Wireless Keyboard, order number M9270LL/A
- Apple Wireless Mouse, order number M9269Z/A
- Mighty Mouse, order number MA086LL/A
- .Mac, order number MA361Z/A

Extended Service and Support

Give yourself long-term peace of mind by extending the complimentary coverage on your 17-inch MacBook Pro to three years from the computer's purchase date. The comprehensive AppleCare Protection Plan includes direct expert telephone assistance, global repair coverage for your MacBook Pro system, web-based support resources, and powerful diagnostic tools—all for one economical price. You can also enroll one Apple display for coverage, provided that the MacBook Pro and display are purchased together. For more information, visit www.apple.com/support/products.

Technical Specifications

Processor and memory

- 2.16GHz Intel Core Duo processor
- 2MB on-chip shared L2 cache
- 667MHz frontside bus
- 1GB (single SO-DIMM) of 667MHz DDR2 SDRAM (PC2-5300); two SO-DIMM slots support up to 2GB

Storage

- 120GB 5400-rpm Serial ATA hard drive; optional 100GB 7200-rpm drive[8]
- Slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW)
  - Maximum write speeds: 8x DVD-R and DVD+R; 4x DVD-RW and DVD+RW; 2.4x DVD+R (double layer); 24x CD-R; 16x CD-RW
  - Maximum read speeds: 8x DVD-ROM (single layer); 6x DVD-ROM (double layer), DVD-R, DVD-RW, DVD+R, and DVD+RW; 24x CD-R

Communications

- Built-in 54-Mbps AirPort Extreme wireless networking[4] (based on 802.11g standard)
- Built-in 3-Mbps Bluetooth 2.0 + Enhanced Data Rate (EDR)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

Expansion

- One FireWire 400 port at up to 400 Mbps[11]
- One FireWire 800 port at up to 800 Mbps[11]
- Three USB 2.0 ports at up to 480 Mbps
- ExpressCard/34 slot

Display

- 17-inch (diagonal) TFT widescreen display with support for millions of colors
- Supported resolutions: 1680 by 1050 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched

Video and graphics support
- ATI Mobility Radeon X1600 graphics processor with 256MB of GDDR3 SDRAM and dual-link DVI support
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors[15]
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight VGA video camera with 640-by-480-pixel resolution

Audio
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

Battery and power
- 68-watt-hour lithium-polymer battery with integrated charge indicator LEDs
- 85W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

Security
- Kensington cable lock slot

Input
- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
- Illuminated fiber-optic backlit keyboard with ambient light sensor for automatic adjustment of keyboard illumination and screen brightness
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

Electrical and environmental requirements
- Meets ENERGY STAR requirements
- Line voltage: 100V AC or 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6A maximum
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Size and weight
- Height: 1.0 inch (2.59 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.4 inches (26.5 cm)
- Weight: 6.8 pounds (3.1 kg) with battery and optical drive installed[7]

For More Information

For more information about MacBook Pro, visit www.apple.com/macbookpro.

To find out more about Mac OS X, visit www.apple.com/macosx.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. [1]Video conferencing requires broadband Internet connection; fees may apply. [2]Based on application performance testing conducted by Apple in April 2006. See www.apple.com/macbookpro for more information. [3]See www.apple.com/rosetta for information on Rosetta-supported Apple software. Contact the manufacturer directly regarding third-party software. Rosetta does not translate Classic Macintosh applications or enable MacBook Pro to run applications written only for Microsoft Windows. [4]Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions. Achieving data rates of up to 54 Mbps requires that all users have an AirPort Extreme– or 802.11g-enabled computer and connect to an AirPort Extreme or AirPort Express Base Station or other 802.11g access point. Actual speeds will vary based on range, connection rate, site conditions, size of network, and other factors. Wireless printing over USB requires Mac OS X v10.2.7 or later and a compatible printer. [5]iWeb requires Internet and web server access; .Mac recommended. The .Mac service is available to persons age 13 and older. Annual membership fee and Internet access required. Terms and conditions apply. [6]Keynote is available as part of iWork '06 (sold separately). [7]Actual weight varies by configuration and manufacturing process. [8]1GB = 1 billion bytes; actual formatted capacity less. [9]May require adapter, sold separately. [10]iTunes is for legal or rightholder-authorized copying only. The iTunes Music Store is available only to persons age 13 and older in the U.S. and many other countries. Requires Internet access. Terms apply. [11]Actual rates will vary. [12]AirPort Express requires an 802.11b- or 802.11g-enabled computer and Mac OS X, Windows XP, or Windows 2000. Wireless printing over USB requires Mac OS X v10.2.7 or later and a compatible printer. Streaming music requires iTunes 4.6 or later. [13]The .Mac service is available to persons age 13 and older. Annual membership fee and Internet access required. Terms and conditions apply. [14]Photocast publishing requires .Mac. The .Mac service is available to persons age 13 and older. Annual membership fee and Internet access required. Terms and conditions apply. iPhoto print services are available in the U.S., Canada, Japan, and select European countries. Requires Internet access; fees and terms apply. [15]Some third-party DVI displays may not support all resolutions.

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